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Smith

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(54) **AMBIDEXTROUS GLOVE WITH SENSITIVITY-ENHANCING DIGIT TIP INSERTS**

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Related U.S. Application Data

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A41D 13/08	(2006.01)
A41D 19/00	(2006.01)
A41D 19/015	(2006.01)

(52) **U.S. Cl.**

CPC ***A41D 19/0082*** (2013.01); ***A41D 13/087*** (2013.01); ***A41D 19/0003*** (2013.01); ***A41D 19/0024*** (2013.01); ***A41D 19/0058*** (2013.01); *A41D 19/01547* (2013.01)

(58) **Field of Classification Search**

CPC A41B 19/04; A41D 13/08; A41D 13/087

See application file for complete search history.

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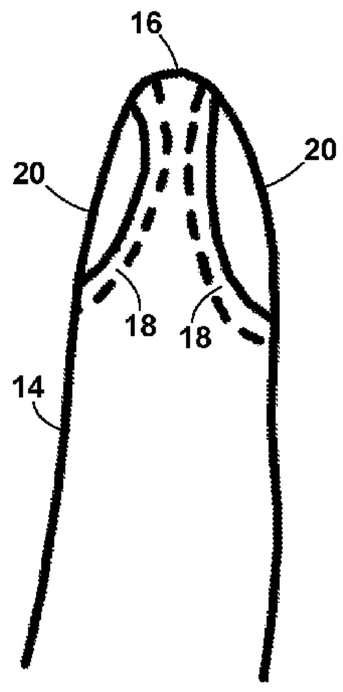
(57) **ABSTRACT**

An ambidextrous glove for facilitating accurate tactility and dexterity on the distal finger pad tips. The glove has finger tip inserts facilitating tactile sensitivity. The inserts are located between the finger tips and first joint on both sides of at least the thumb, index finger, and middle finger. Optionally, the glove is turned inside out. Holes are cut in both sides of the finger tip. The inserts are adhered to the finger tip to cover the holes. If the glove was turned inside out, it is turned outside out.

4 Claims, 6 Drawing Sheets



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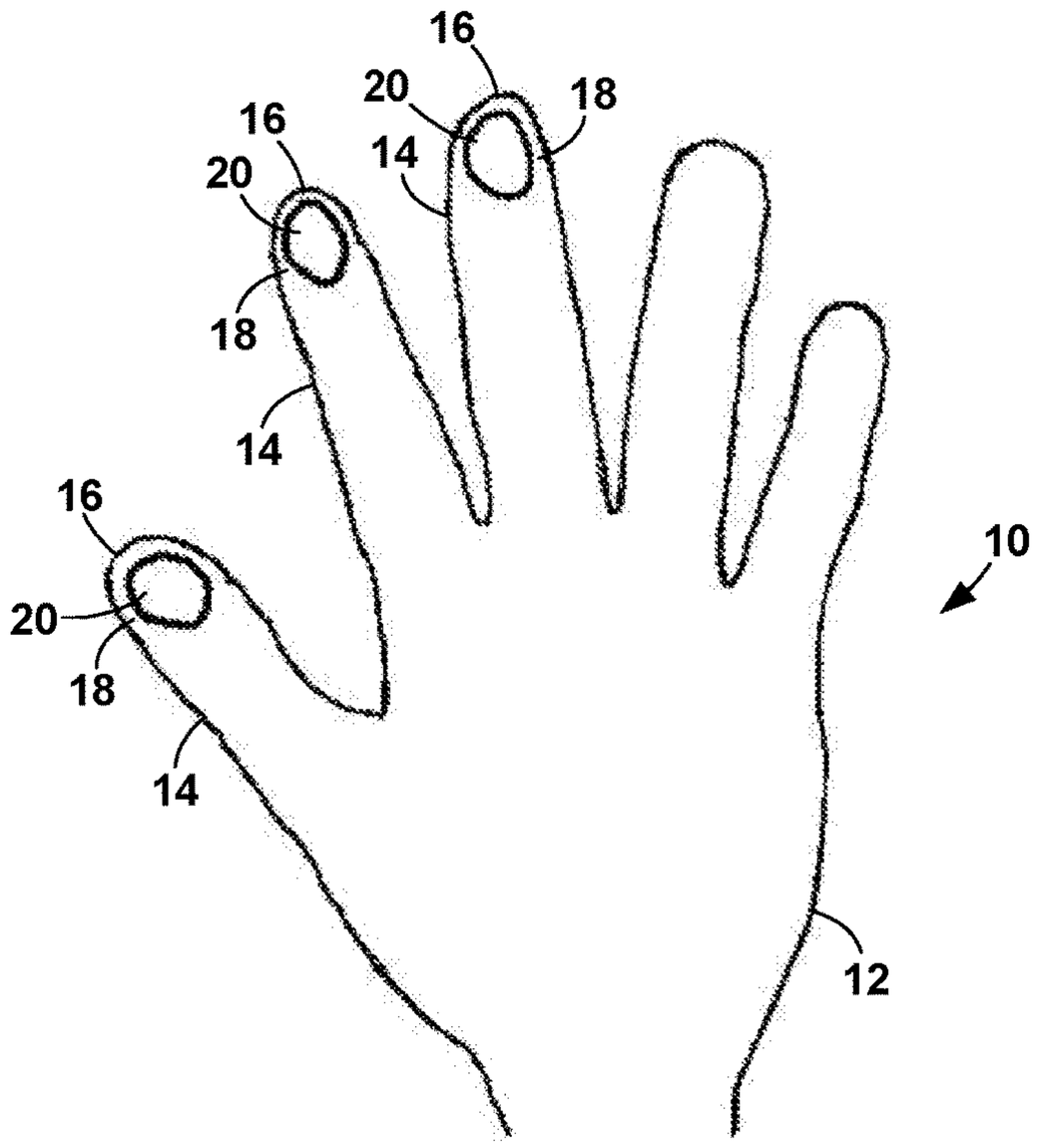

FIG. 1

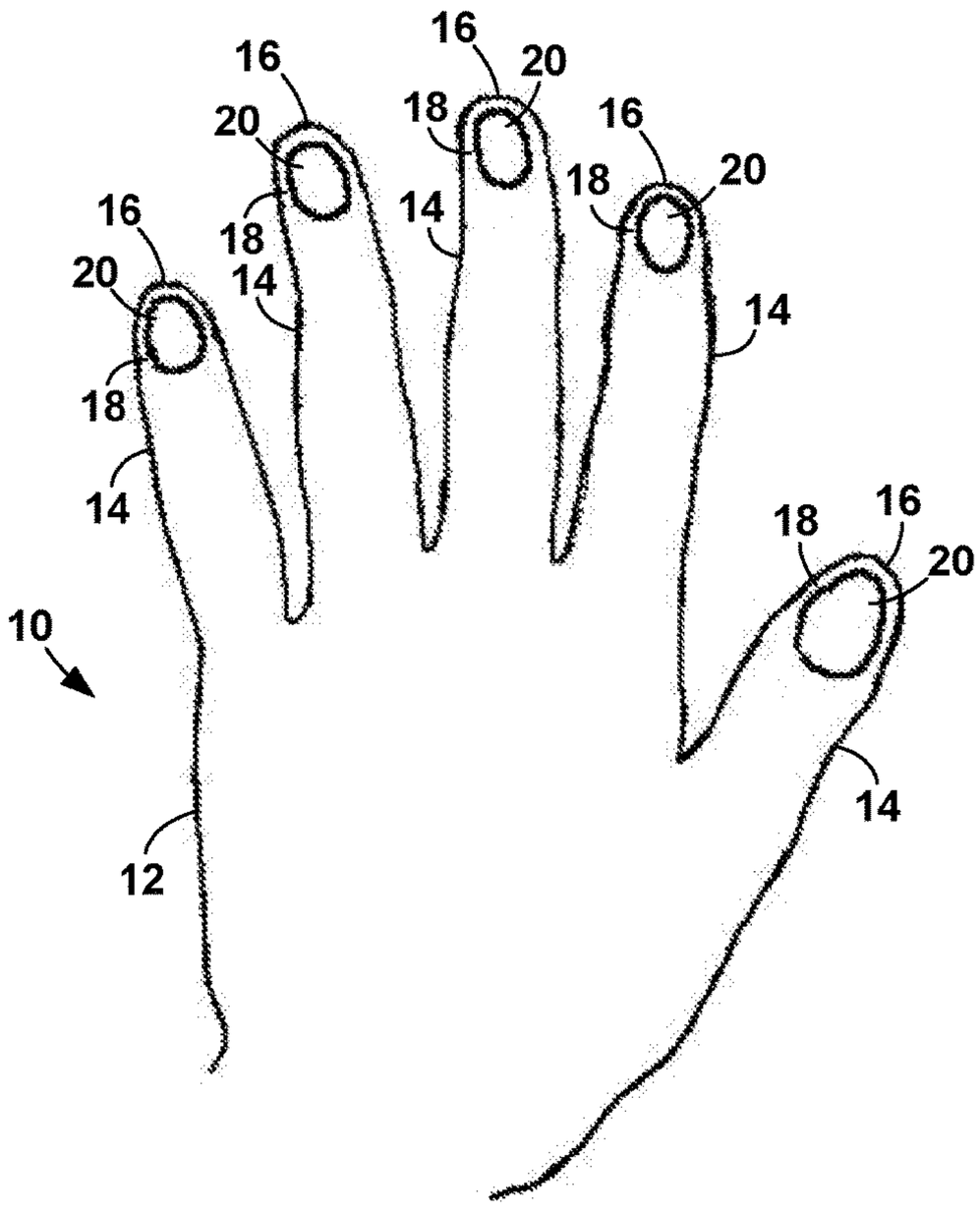

FIG. 2

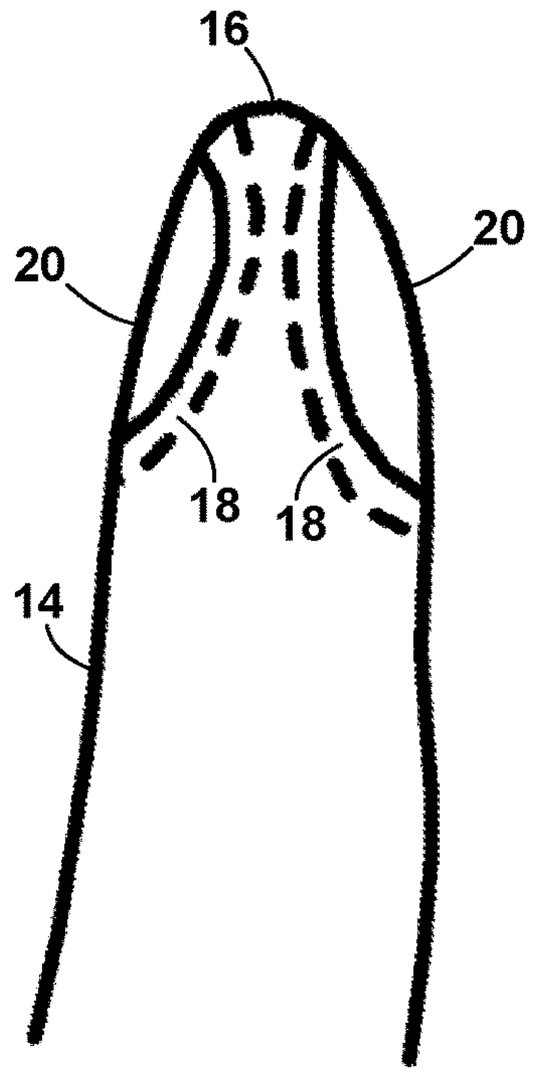

FIG. 3

FIG. 4

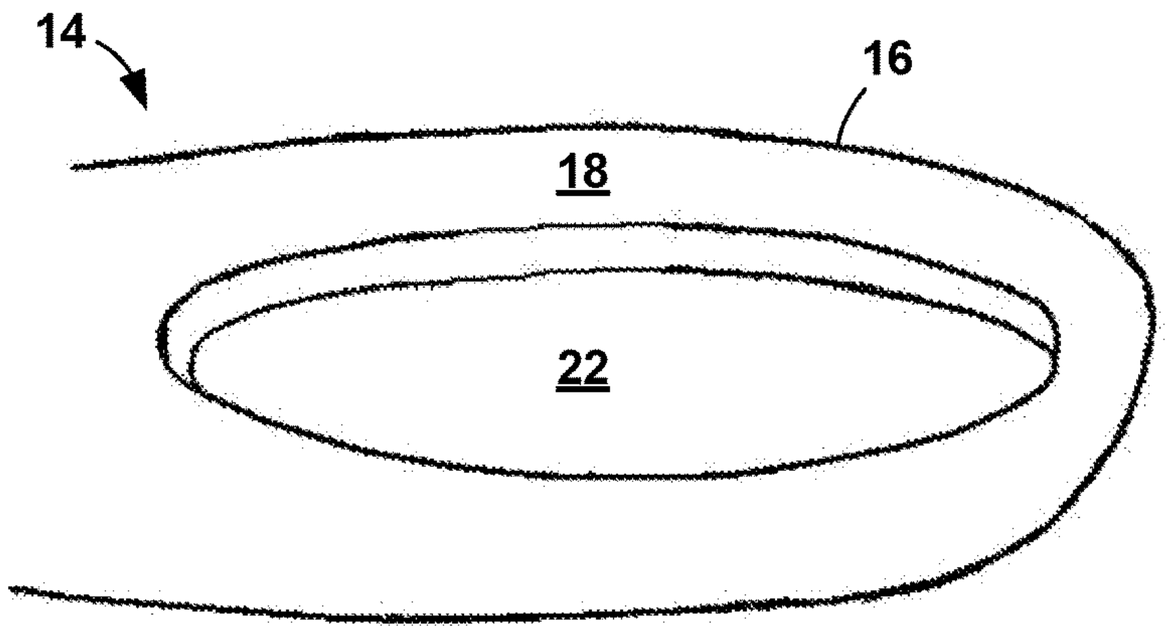

FIG. 5

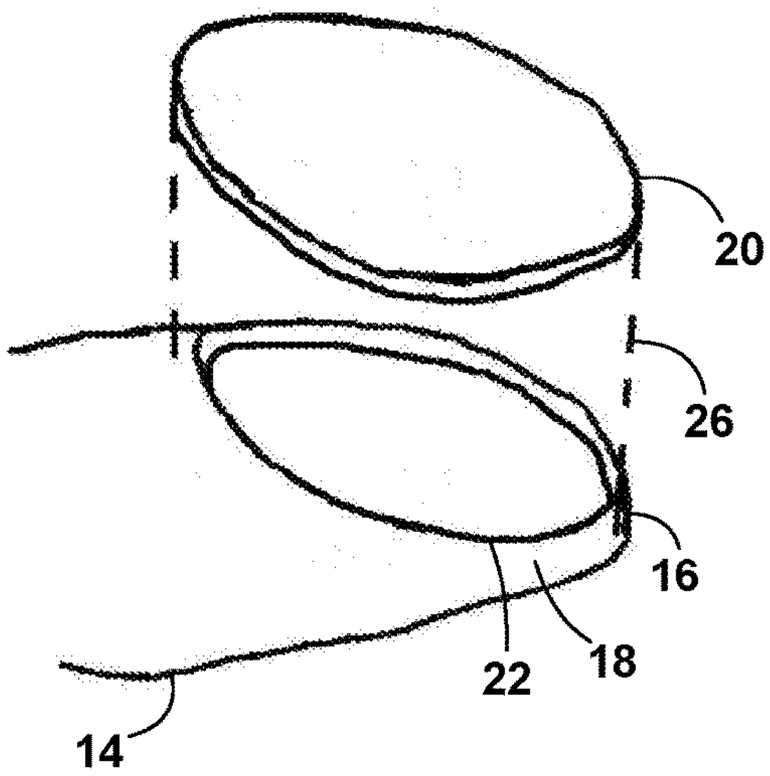

FIG. 6

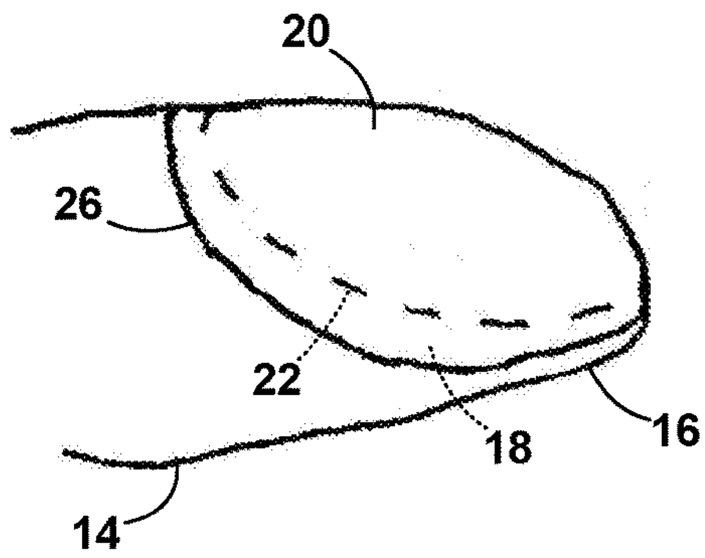

FIG. 7

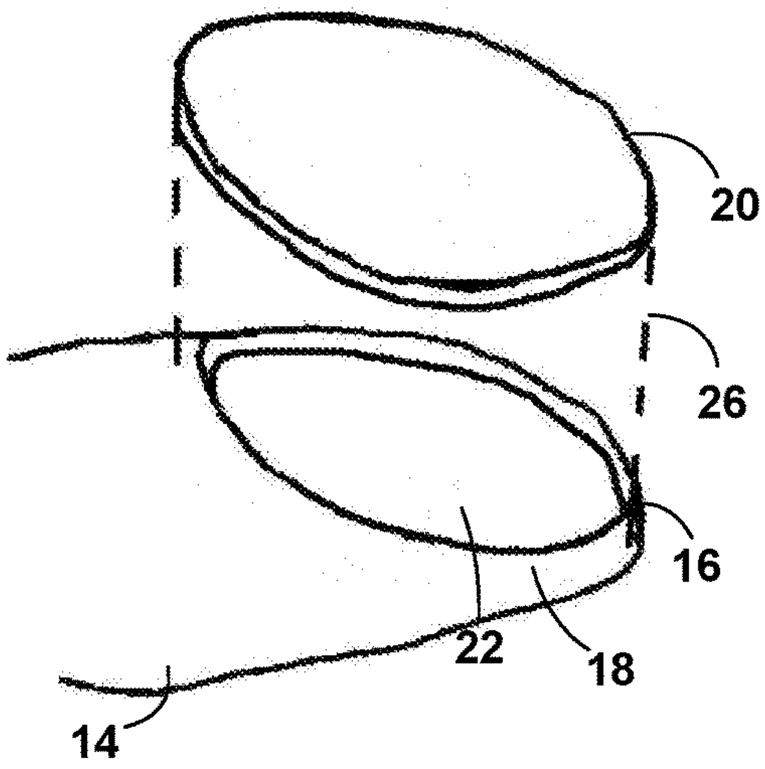

FIG. 8

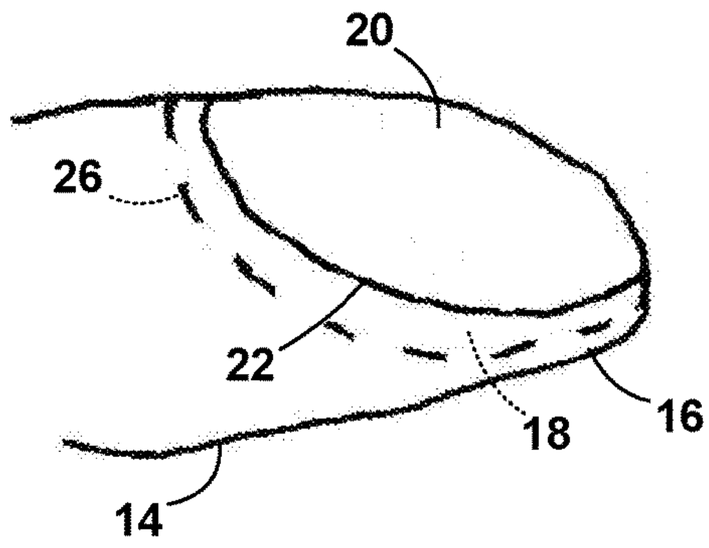

FIG. 9

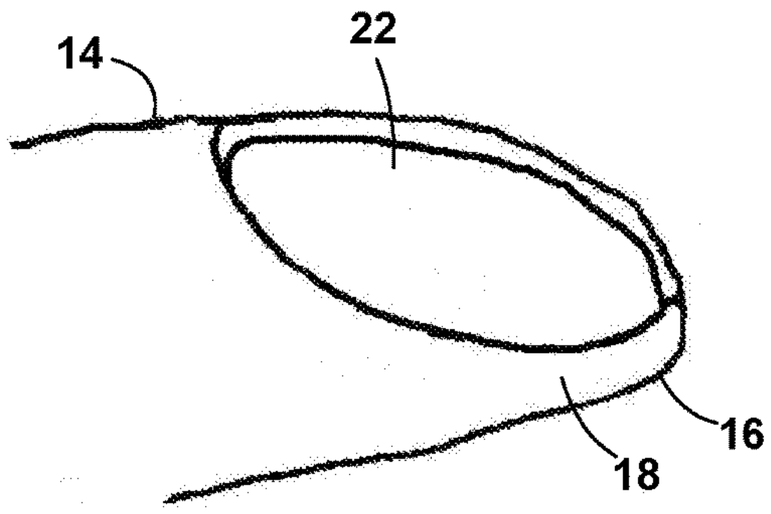

FIG. 10

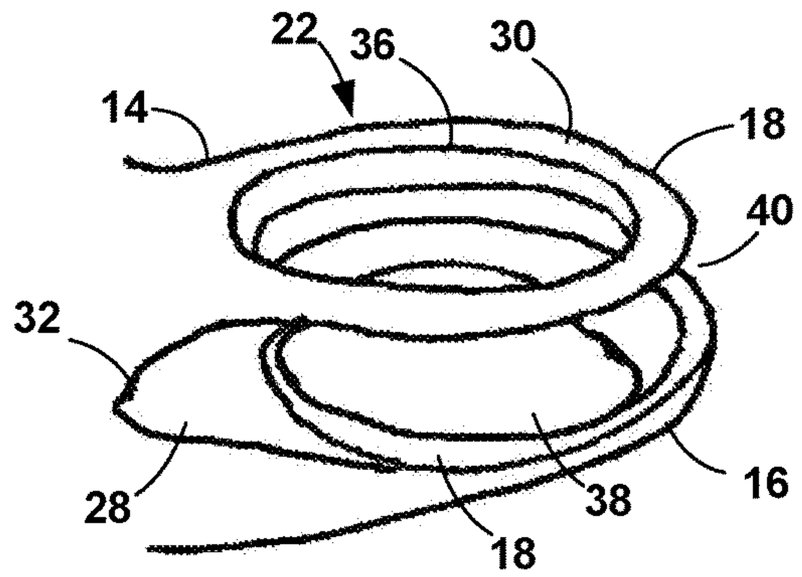

FIG. 11

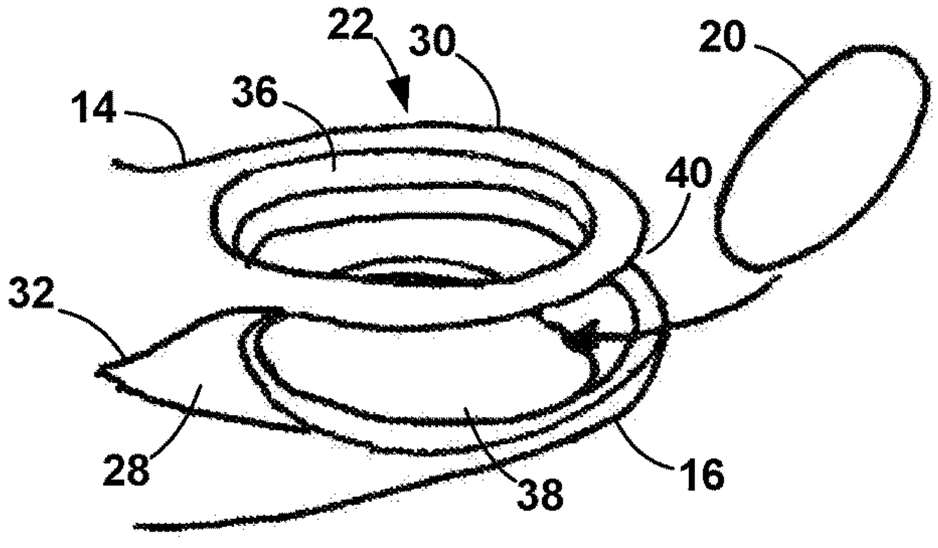

FIG. 12

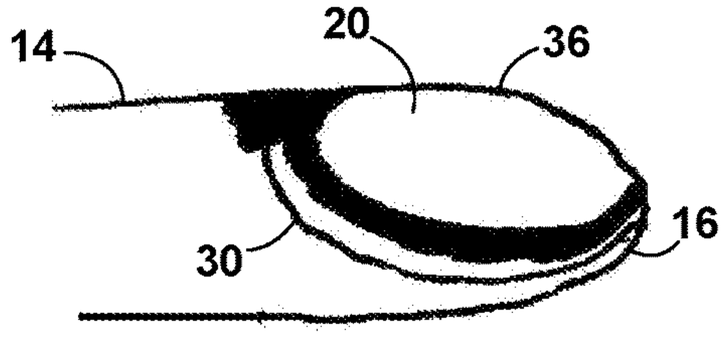

FIG. 13

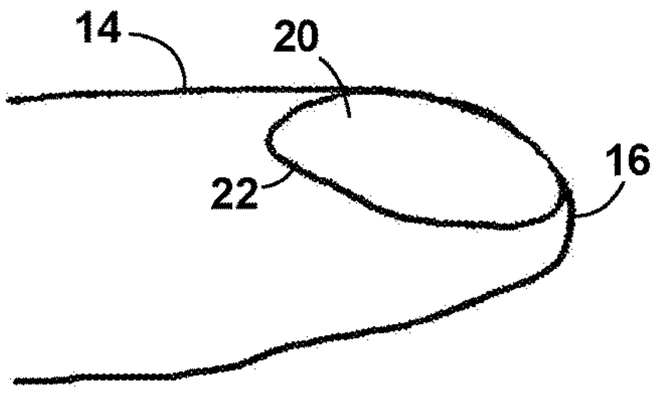

FIG. 14

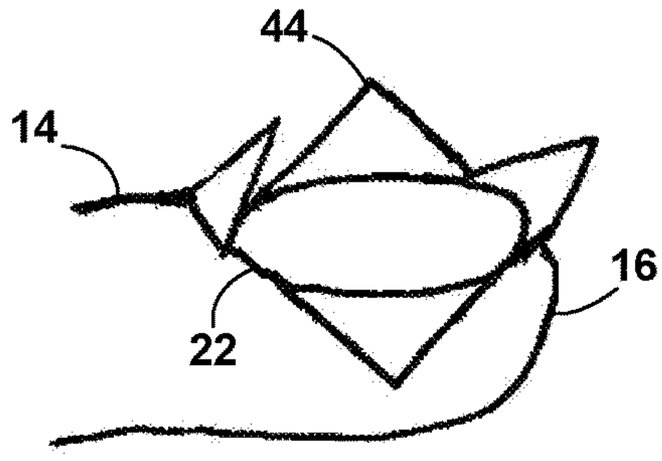

FIG. 15

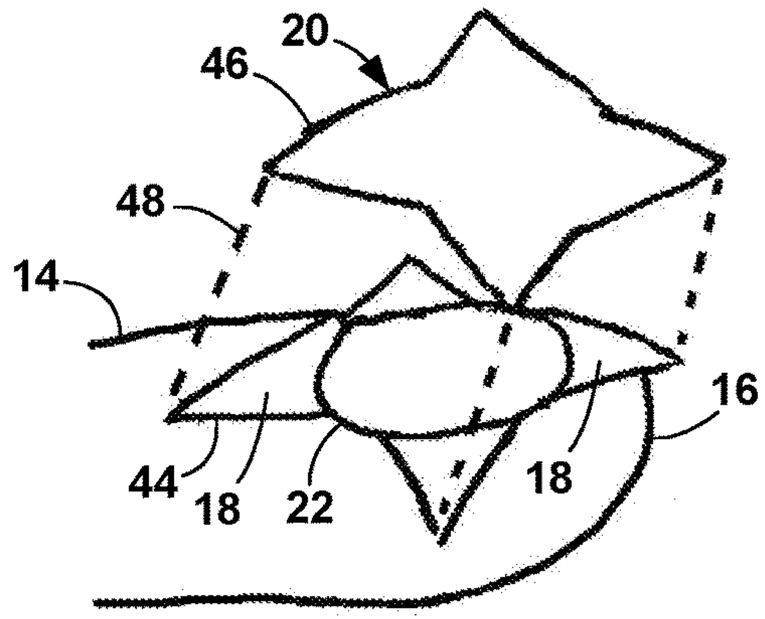

FIG. 16

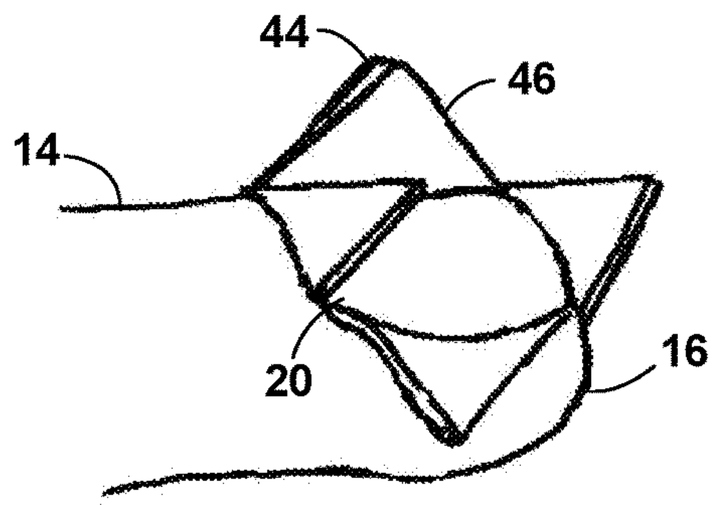

FIG. 17

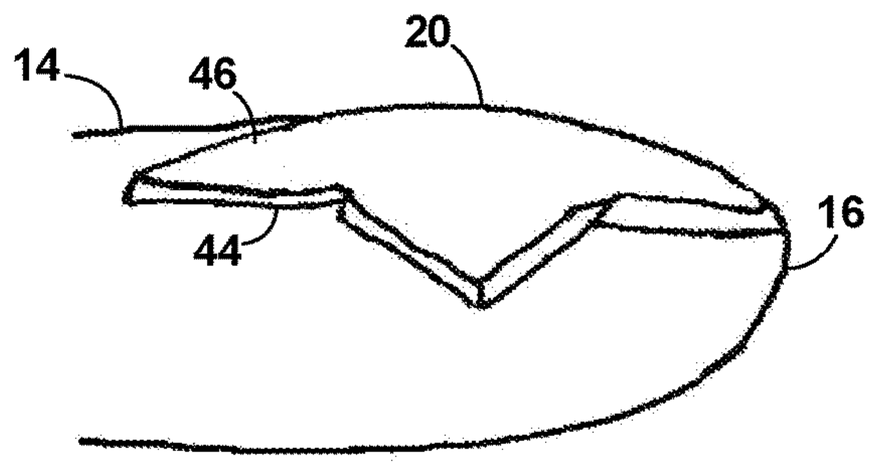

FIG. 18

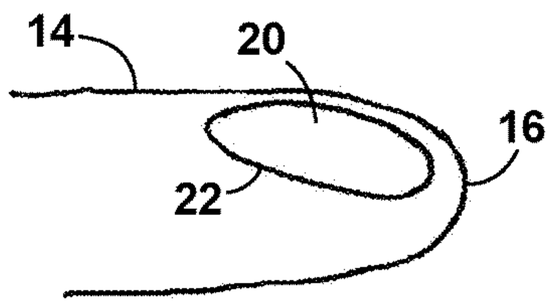

FIG. 19

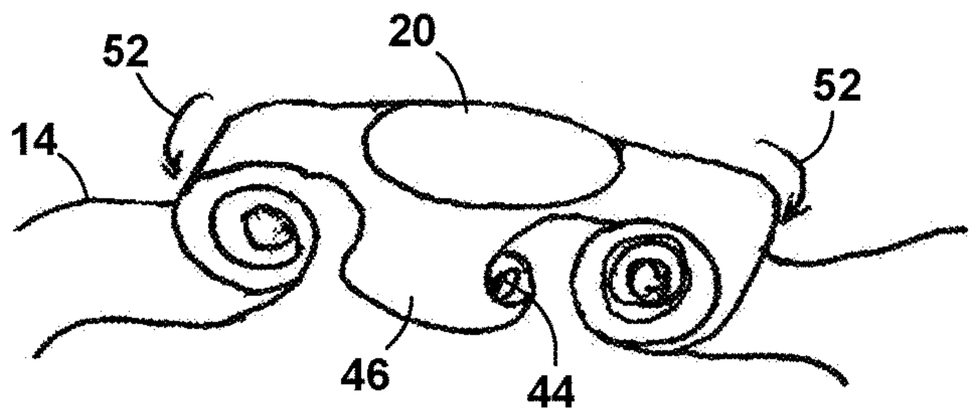

FIG. 20

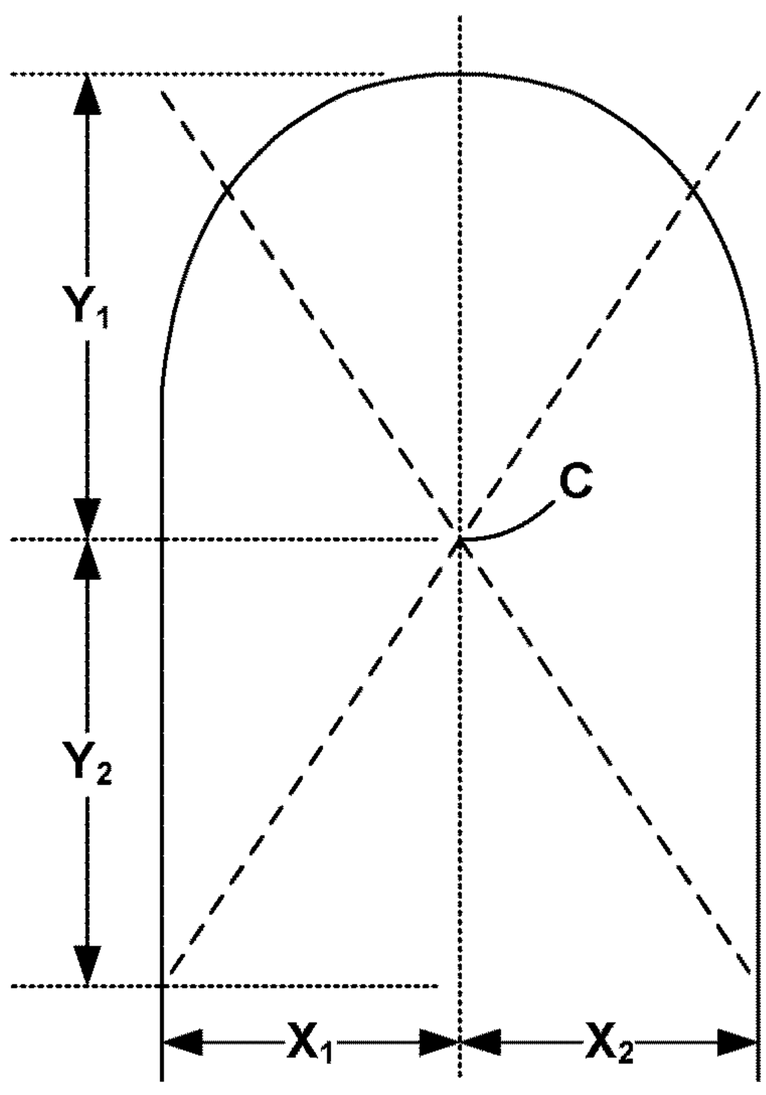

FIG. 21

AMBIDEXTROUS GLOVE WITH SENSITIVITY-ENHANCING DIGIT TIP INSERTS

STATEMENT REGARDING FEDERALLY SPONSORED RESEARCH OR DEVELOPMENT

Not Applicable

REFERENCE TO A SEQUENCE LISTING, A TABLE, OR A COMPUTER PROGRAM LISTING COMPACT DISK APPENDIX

Not Applicable

BACKGROUND OF THE INVENTION

1. Field of the Invention

This invention relates to medical gloves, which nurses, allied health professionals, and the like use during the performance of their duties, such as feeling for a patient's arteries and veins, as well as entering data into touch screen devices.

2. Description of the Related Art

Nurses and other health professionals rely heavily on their distal superior phalangeal pads (palmer side fingertips) when performing medical procedures such as drawing blood, using intravenous therapy, determining pulse, and entering data for diagnostic tests via touch screen medical devices, all while being exposed to dangerous diseases. They need a high level of tactile sensitivity and dexterity on their palmer side fingertips to perform these procedures.

Consequently, a medical glove is necessary to nurses and other health professionals. Unfortunately, the material of the palmer side fingertips of a conventional medical glove has a uniform thickness, thereby failing to provide the necessary level of tactile sensitivity and dexterity. As a result, nurses and other health professionals have difficulty in performing necessary duties.

Hence, a medical glove capable of providing a high level of tactile sensitivity and dexterity on their distal palmer finger pad tips to a degree sufficient to allow nurses and other health professionals to carry out medical procedures without uncertainty is desirable.

BRIEF SUMMARY OF THE INVENTION

The present invention satisfies a necessity and remedies the shortcomings of the prior art through the provision of a glove for facilitating accurate tactility and dexterity on the finger pad tips.

The glove has an inner surface and an outer surface with five digits and is designed to be ambidextrous, that is, the glove can be put on either hand. Each thumb/finger tip has a pair of thin distal finger tip inserts, one on each side of the finger between the finger tip end and the first joint. The inserts are composed of a material that facilitates tactile sensitivity where it is most needed by the clinician. The insert is attached to the inside surface, outside surface, or within a slit in the area surrounding the hole at the finger tip.

Objects of the present invention will become apparent in light of the following drawings and detailed description of the invention.

BRIEF DESCRIPTION OF THE DRAWINGS

For a fuller understanding of the nature and object of the present invention, reference is made to the accompanying drawings, wherein:

FIG. **1** is a view of the glove of the present invention with inserts on three digits;

FIG. **2** is a view of the glove of the present invention with inserts on all five digits;

FIG. **3** is a side view of a digit showing inserts on both sides of the digit;

FIG. **4** is a detailed view of an insert;

FIG. **5** is a detailed view of one side of the digit tip with a hole and surrounding surface;

FIG. **6** is a detailed, exploded view of the insert attached to the outside of the digit tip;

FIG. **7** is a detailed, assembled view of the insert attached to the outside of the digit tip;

FIG. **8** is a detailed, exploded view of the insert attached to the inside of the digit tip;

FIG. **9** is a detailed, assembled view of the insert attached to the inside of the digit tip;

FIG. **10** is a detailed view of the first step, hole cut, of the lateral incision method of attaching the insert;

FIG. **11** is a detailed view of the second step, lateral incision, of the lateral incision method of attaching the insert;

FIG. **12** is a detailed view of the third step, insert placement, of the lateral incision method of attaching the insert;

FIG. **13** is a detailed view of the fourth step, insert attachment, of the lateral incision method of attaching the insert;

FIG. **14** is a detailed, assembled view of the insert attached via the lateral incision method;

FIG. **15** is a detailed view of the first step, hole cut, of the triangular flap method of attaching the insert;

FIG. **16** is a detailed view of the second step, insert cut and attach, of the triangular flap method of attaching the insert;

FIG. **17** is a detailed view of the third step, flap flatten, of the triangular flap method of attaching the insert;

FIG. **18** is a detailed view of the fourth step, flap attach, of the triangular flap method of attaching the insert;

FIG. **19** is a detailed, assembled view of the insert attached the triangular flap method;

FIG. **20** is a detailed alternative rolled attachment for the triangular flap method; and

FIG. **21** is a detailed view of the cut parameters for the triangular flap method.

DETAILED DESCRIPTION OF THE INVENTION

The present application hereby incorporates by reference in its entirety U.S. patent application Ser. No. 15/098,715, on which this application is based.

The present invention is an ambidextrous glove **10** with thumb and/or finger tip inserts **20** on the both sides of the thumb and/or fingers (collectively referred to herein as "digit" or "digits"), so that the wearer has increased sensitivity regardless of which hand the glove is put on. The inserts **20** are composed of a thin, sensitive material such as latex, rubber, synthetic rubber, special rubber, lambskin, nitrile, poly-isoprene, polyurethane and the like which has the ability to be in close contact with the digit tip pads, thereby facilitating increased sensitivity and dexterity.

The glove **10** of the present invention is depicted and exhibited in FIGS. **1-3**. FIGS. **4-21** refer to components of the glove **10**. Furthermore, the figures are not intended to limit the scope of the invention, but rather illustrate a representation of the presently preferred embodiments of the invention.

In reference to FIGS. **1** and **2**, the figures are shown in accordance with the principles of the invention. The ambidextrous glove **10** has two components, a main unit **12**, which includes the digits **14**, and the inserts **20**, which are attached to or otherwise integrated onto the surrounding digit surface (SDS) **18** around holes **22** on both sides of the digit tip **16**. The digit tip **16** is defined as the end portion of the digit **14** from approximately the last finger joint to the end of the digit **14**.

The main glove unit **12** is typically comprised of a single layer of elastic material such, as but not limited to, latex, vinyl, nitrile, isoprene, and neoprene.

The thickness of the material of the main glove **12** is measured in millimeters (mm) or mils (1 mil=0.001 inch). The thickness may vary depending on the material used, but is not typically more than 0.50 mm. Example thicknesses for various materials are shown in TABLE A.

TABLE A

Material	Average finger tip thickness	Average cuff thickness
Neoprene	0.18 mm = 7.1 mils	0.14 mm = 5.5 mils
Poly-isoprene	0.18 mm = 7.1 mils	0.14 mm = 5.5 mils
Poly-isoprene	0.18 mm = 7.1 mils	0.14 mm = 5.5 mils
Poly-isoprene	0.18 mm = 7.1 mils	0.14 mm = 5.5 mils
Latex	0.13 mm = 5.1 mils	0.08 mm = 3.1 mils
Latex	0.13 mm = 5.1 mils	0.08 mm = 3.1 mils
Latex	0.13 mm = 5.1 mils	0.08 mm = 3.1 mils
Latex	0.14 mm = 5.5 mils	0.09 mm = 3.5 mils
Latex	0.14 mm = 5.5 mils	0.09 mm = 3.5 mils
Latex	0.16 mm = 6.2 mils	0.10 mm = 4.0 mils
Latex	0.16 mm = 6.2 mils	0.10 mm = 4.0 mils
Latex	0.23 mm = 9.5 mils	0.20 mm = 7.8 mils
Latex	0.23 mm = 9.5 mils	0.20 mm = 6.5 mils
Latex	0.31 mm = 12.5 mils	0.24 mm = 9.4 mils
Latex	0.23 mm = 9.1 mils	0.17 mm = 6.5 mils
Bismuth Oxide Latex	0.35 mm = 13.7 mils	0.24 mm = 9.3 mils
Nitrile	0.30 mm = 11.8 mils	0.30 mm = 11.8 mils

For a given material, one may assume that thinner gloves allow better dexterity and flexibility, whereas thicker gloves provide better protection but less flexibility. With the highly-sensitive material attached to or integrated with the main glove unit **12** onto the surrounding digit surface **18**, a degree of integrity is maintained and the level of sensitivity and dexterity is enhanced.

The highly-sensitive material that is connected or integrated at the surrounding digit surface **18**, which makes up distal digit tips **16** of the glove digits **14**, is comprised of a single thin layer of material, which is composed of but is not limited to latex, polyurethane, poly-isoprene, and/or polyurethane film (TEGADERM).

Examples of thicknesses of various compositions of highly-sensitive material are shown in TABLE B, with a contemplated maximum thickness of 0.20 mm.

TABLE B

Material	Thickness in mm
Latex	0.044 to 0.121
Polyisoprene	0.045 to 0.06

TABLE B-continued

Material	Thickness in mm
Polyurethane	0.0011 to 0.0027
Polyurethane film (TEGADERM)	0.025

Polyurethane can be made thinner than latex and it also has the ability to transmit body heat better than latex. The advantages of polyurethane include its ability to transfer body heat, odorless, clear, no latex allergens, strength, and compatibility with water-based and oil-based lubricants. The disadvantages are that it is not as elastic as latex and the selection is very limited.

Polyisoprene has all the characteristics of latex plus it is soft, is a non-latex material, has good elasticity, strength, and is compatible with water-based lubricants. The disadvantage is that it is not compatible with oil-based lubricants.

The advantages of polyurethane film are that it retains moisture, is impermeable to bacteria, facilitates autolytic debridement, allows wound observation, and does not require a secondary dressing. The disadvantages are as follows: may not be required for infected wounds, not required for wounds with heavy drainage, requires a border of intact skin adhesive edge dressing, may be difficult to apply and handle, may dislodge in high friction areas.

In reference to the drawings, characteristics have been explicitly described which correspond to designated parts throughout the several depictions. The main glove unit **12** can be composed of any one or more of the materials in TABLE A. For example, the main glove unit **12** in FIGS. **1**, **2**, and **5** can be composed of 8-mm-thick nitrile.

In addition, the inserts **20** can be composed of any one or more of the materials in TABLE B. For example, the inserts **20** can be composed of 0.0027-mm-thick polyurethane. Alternatively, the insert **20** can be composed of 0.0027-mm-thick polyurethane.

The insert **20** can be attached to or integrated with the main unit glove's distal surrounding digit surface (SDS) **18** in order to cover the holes **22** of both sides of the five digit tips **16**. The acronym, SDS, refers to the surface **18** surrounding the hole **22**, as shown in FIG. **5**.

Attachment to or integration between the inserts **20** and the SDS **18** on the tips **16** can be achieved by any one or more of various methods. Such methods include, but are not limited to, adhesive, compression, heating, melting, and other manipulations through physical or chemical means. Therefore, the present invention contemplates the use of any method that will attached the insert **20** to the digit tip **16**.

The various materials used for the main glove unit **10** may have a greater thickness than the various thin materials used for the inserts **20**. As a result, the combined thickness of the two components may be different than the two parts separated, but not necessarily, since some methods of combination may result in the two components' thicknesses being uniform.

When the inserts **20** are attached to the tips **16**, both the main glove unit **10** and inserts **20** act as a barrier for protection of the user.

The present invention contemplates a number of different methods for attaching the insert **20** onto the SDS **18** of the tip **16**. These different methods are shown in FIGS. **6-21**.

In the attachment of FIGS. **6** and **7**, a hole **22** is made in the digit tip **16** that is smaller than the size of the insert **20**. The digit **14** is left in the outside out position and the insert **20** is attached, as at **26**, onto the SDS **18** around the hole **22**

by whatever means is appropriate, for example, by adhesive or heat. For the typical thumb, the length Y (along the length of the digit) of the insert **20** is approximately 2.5 cm and the width X (laterally across the digit) of the insert **20** is approximately 2.0 cm. For the typical finger, the length Y of the insert **20** is approximately 2.5 cm and the width X of the insert **20** is approximately 2.0 cm.

In the attachment of FIGS. **8** and **9**, a hole **22** is cut in the digit tip **16** that is smaller than the size of the insert **20**. The glove **10** is turned inside out and the insert **20** is attached onto the SDS **18** around the hole **22** by whatever means is appropriate, for example, by adhesive or heat. After the insert **20** is attached, the glove **10** is turned outside out.

In the attachment of FIGS. **10-14**, a hole **22** is cut in the digit tip **16** that is smaller than the size of the insert **20**. The glove **10** can be in either outside out or inside out. In either case, a thin lateral incision **28** is made below the hole **22**, either approximately ⅛", 1/16", or 1/32" below the hole **22**, whichever is appropriate. The lateral incision **28** extends away from the digit tip **16** creating a flap **30** with a connected rear attachment **32** of ¼" to ⅛". The flap has an upper hole **36** and the digit **14** has a lower hole **38**. There is a gap **40** between the digit **14** and the flap **30**. The SDS **18** is in two parts, one surrounding the upper hole **36** and one surrounding the lower hole **38**.

The insert **20** is inserted into the rear most part of the gap **40**, where the upper peripheral surface of the insert is attached to the under surrounding surface of the upper hole **36** in the flap **30** and the lower peripheral surface of the insert is attached to the upper surrounding surface of lower hole **38** by whatever means is appropriate, for example, by adhesive or heat. Either after attaching the insert **20** or at the same time, the flap **30** is reattached to the digit **14** (the incision **28** is closed) by whatever means is appropriate, for example, by adhesive or heat.

In the attachment method of FIGS. **15-19** the glove **10** is turned inside out. With reference to precut FIG. **21**, the corresponding cuts for the hole **20** are made so that triangular flaps **44** are produced. FIG. **21** shows example cut parameters. TABLE C lists the parameters for fingers and thumb for the typical glove **10**.

TABLE C

Parameter	Thumb	Index Finger	Middle Finger
C to side X_1	0.75 cm	0.75 cm	0.75 cm
C to side X_2	0.75 cm	0.75 cm	0.75 cm
C to Tip Y_1	1.0 cm	1.0 cm	1.0 cm
Center to Joint Y_2	1.0 cm	1.0 cm	1.0 cm

After the cuts, the flaps **44** are folded over to overlap the digit **14**, as in FIG. **16**. The SDS **18** is the area surrounding the hole **22** and includes the flaps **44**.

The insert **20** is formed with wings **46** in the same size and shape as the flaps **44**, as in FIG. **16**, and the insert wings **46** are attached to the flaps **44**, as at **48**, by whatever means is appropriate, for example, by adhesive or heat. The overlapped wings **46** and flaps **44** are attached to the digit **14** so they are flat, as in FIG. **18**, by whatever means is appropriate, for example, by adhesive or heat. After all of the inserts **20** are attached, the glove **10** is turned outside out, as in FIG. **19**. Note that, if appropriate, the flaps **44** can be attached to the digit **14** before the wings **46** are attached to the flaps **44**.

FIG. **20** shows an alternate attachment of the insert **20** to the digit **14**. Adhesive is placed on the surface of flaps **44** and attached to wings **46**. The flaps **44** and wings **46** are then rolled, as at **52**, and both are bonded such that the adhesive is placed at the base of rolled flap/wing combination so it is secured. After all of the inserts **20** are attached, the glove **10** is turned outside out, as in FIG. **19**.

Thus it has been shown and described an ambidextrous glove with sensitivity-enhanced digit tip inserts on both sides of the digit. Since certain changes may be made in the present disclosure without departing from the scope of the present invention, it is intended that all matter described in the foregoing specification and shown in the accompanying drawings be interpreted as illustrative and not in a limiting sense.

What is claimed is:

1. An ambidextrous glove comprising:

(a) a main portion and five digits with distal digit tips, all composed of an elastic material not more than 0.50 mm thick;

(b) at least three of the distal digit tips having inserts on both sides of the distal digit tips where opposed spaced apart inserts are positioned on each of the three distal digit tips, the inserts being composed of a thin sensitive material; and

(c) each side of the at least three of the distal digit tips having a hole with a surrounding digit surface, the insert placed to cover the hole and attached to the surrounding digit surface.

2. The ambidextrous glove of claim **1** wherein the elastic material is selected from the group consisting of latex, vinyl, nitrile, isoprene, and neoprene.

3. The ambidextrous glove of claim **1** wherein the sensitive material is no more than 0.20 mm thick and is selected from the group consisting of latex, rubber, synthetic rubber, lambskin, nitrile, poly-isoprene, and polyurethane.

4. The ambidextrous glove of claim **1** wherein five of the distal digit tips have the inserts.

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